Subject: Re: FTB workflows
From: Aurélien Bouteiller <bouteill@eecs.utk.edu>
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To: cifts@googlegroups.com

Here are the workflows we envisioned regarding FTLA and our HEAT application at UTK.

Workflow #1:

FTLA Application cooperates with job scheduler to recover from node failure

1. Job scheduler listen for CAN_SURVIVE_FAILURE events
2. Application job#k notify it can tolerate failures by sending the aforementioned event
3. Job scheduler/resource manager mark job#k as a "resilient" application
4. RAS or Resource manager of application detects failure of node#N and sends a NODE_FAILURE(N)
5. Job scheduler receive NODE_FAILURE(N), sort out that node#N is part of job#k
6. Job#k detects node#N is failed. Application computes available recovery actions and computes
an estimate of various strategies. It sends out a message CAN_RECOVER(#new_nodes: walltime, no_new_nodes: walltime).
7. Job scheduler and resource manager exchange messages to determine if they can (or want to) give new nodes to job#k and send out a reply SPARE(node#N+1) or NOSPARE or CHECKPOINT or CLEANUP
8. job#k reacts according to answer, if CHECKPOINT, try to take checkpoint and send CHECKPOINT_ACK when done.

Possible extensions: notifications of the precision loss to let an autonomic component
take a decision about restarting from scratch if precision is too bad after recovery.

Workflow #2:

HEAT application cooperates with filesystem to manage checkpoint data failure

1. HEAT application register for FILE_LOST events
2. HEAT application stores checkpoints in the PVFS
3. Failures hit PVFS, PVFS sends a notification FILE_LOST
4. HEAT application takes corrective actions to rebuild missing parts of checkpoint data

Possible extensions: managing checkpoint generated contention by letting file system
hint when it is idle and therefore available to checkpoint traffic.

Thanks,
Aurelien

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